PAPER NAME

The Effect of Variations of Red Bricks, Sa nd, Sawdust, and Green Tea.pdf

AUTHOR

Nur Hidayati

WORD COUNT

3527 Words

CHARACTER COUNT

17511 Characters

PAGE COUNT

7 Pages

FILE SIZE

264.5KB

SUBMISSION DATE

Sep 21, 2022 6:34 AM GMT+7

REPORT DATE

Sep 21, 2022 6:36 AM GMT+7

11% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

- 9% Internet database
- 8% Publications database
- Crossref database
- Crossref Posted Content database
- 4% Submitted Works database

Excluded from Similarity Report

- Bibliographic material

JURNAL BIOMEDIKA
Volume 15 No. 01 March 2022
P-ISSN: 1979 - 035X (printed) & E-ISSN: 2302 – 1306 (online)
DOI: https://doi.org/10.31001/biomedika.v15i1.1203

The Effect of Variations of Red Bricks, Sand, Sawdust, and Green Tea (*Camellia sinensis*) Media on the Fat Content of Salted Egg Yolks

Nur Hidayati[1]*, Mardiyono[2], and Dian Kresnadipayana[3]

[1]Diploma in Medical Laboratory Technology Department, Faculty of Health Sciences,
Universitas Setia Budi, Jl. Letjen Sutoyo, Mojosongo, Kec. Jebres, Kota Surakarta, Jawa Tengah 57127, Indonesia

[2]Bachelor in Pharmacy Department, Faculty of Pharmacy,
Universitas Setia Budi, Jl. Letjen Sutoyo, Mojosongo, Kec. Jebres, Kota Surakarta, Jawa Tengah 57127, Indonesia

[3]Bachelor of Applied Science in Medical Laboratory Technology Department, Faculty of Health Sciences,
Universitas Setia Budi, Jl. Letjen Sutoyo, Mojosongo, Kec. Jebres, Kota Surakarta, Jawa Tengah 57127, Indonesia

ARTICLE INFO

Article History:
Received: February, 2021
Revise: September, 2022
Accepted: July, 2022

Keywords: salted eggs, variation of salting media, soxhlet extraction, fat content

ABSTRACT

Salting is done to extend the shelf life of duck eggs. A variety of media can be used for salting eggs, including a mixture of salt, sand, red brick, sawdust, and brewed tea. Salted eggs are popular among the general public, but they contain a lot of fat, which, if consumed in excess, can cause blood vessel blockage (atherosclerosis). Green tea is a plant that has many benefits, one of which is that it can help people lose weight. Duck eggs were ripened for 12 days in a variety of salting media with different ingredients for this study. Red bricks, sand, sawdust, salt, and brewed green tea are among the materials used. This study aimed to determine the fat content of salted egg yolks using the Soxhlet extraction method, as well as the color, aroma (smell), and taste of salted eggs. The data in this study were analyzed using One-Way ANOVA and the results revealed that variations in salting media had a significant effect on fat content in salted egg yolks. The results showed the changes in fat content in salted egg yolks without treatment with a fat content of 36.28 percent, and with treatment with media A (sand, red bricks, and sawdust); media B (sand, red bricks, and sawdust); media 1 (media A added with green tea); and media 2 (media B added with green tea), with the fat contents of 35.22%; 32.86%, and 30.49%. Mixed media of green tea affects the fat content of salted egg yolks, from 36.50% to 32.86% and 30.49%.

*Corresponding author:
Nur Hidayati
Diploma in Medical Laboratory Technology Department, Faculty of Health Sciences, Universitas Setia Budi
Email: nurhidayati.nh@gmail.com

INTRODUCTION

During the harvest season, duck egg production is abundant, as when the COVID-19 pandemic outbroke, people need good nutritional intake to maintain their immunity, including by consuming foods with high protein content, such as chicken and duck eggs. Various activities of processing food from eggs are done by the community to provide a variety of food menus, including salted eggs. Salted egg is a general term for egg-based dishes preserved by salting. Most salted eggs are duck eggs because duck eggs have larger pores, a more complex shell thickness, and high nutritional value than other eggs. Salted eggs are stable and can be stored longer. Salting reduces the fishy taste of the eggs and makes them more delicious. Moreover, the eggs have a long shelf life and a distinctive taste (Yuniati, 2012).

The media that can be used for making salted eggs are sand, red brick powder, and the natural material of sawdust. Sand and red brick powder are abundantly available and economical. Sawdust, which is commonly considered a pollutant because it is used as furnace fuel or just burnt, can be further utilized to make salted eggs. Teak sawdust is biomass that has not been used optimally and has a relatively large calorific value (Kusumaningrum and Yudanto, 2015). Sawdust is selected to improve the use of waste, particularly to produce tasty and quality salted eggs. The quality of the eggs consumed can be measured from several factors, including the color of the yolks and the nutritional content in the egg (such as fat and egg yolk cholesterol levels). The fat content of the egg yolks needs to be considered because it is quite high (Muharlien, 2010).

The effort to reduce fat content in salted eggs is carried out by adding green tea to the salting medium. Green tea leaves contain catechins, which include epigallocatechin gallate (EGCG), epigallocatechin (EGC), epicatechin gallate (ECG), epicatechin (EC), and gallocatechin (GC) compounds. Catechine compounds can act as antioxidants and reduce fat (Wulandari and Rahmanisa, 2016). Green tea is a plant with many benefits, such as lowering fat levels and cholesterol levels, as well as reducing weight (Muharlien, 2010). The salting process, which is accompanied by the tanning of eggshells using tea leaf extract, will produce eggs with a longer expiry date because the eggs undergo double preservation that reduces the initial number of micro-organisms in the eggs. The tannins contained in the tea leaf extract enter through the pores of the eggs, and this produces the distinctive taste and color of brewed tea.

This study used duck eggs that were ripened for 12 days in a variety of salt media to determine the effect of variations in salting media on the fat content of the salted egg yolk and the characteristics of salted eggs, including color, aroma (smell), and taste.

MATERIALS AND METHODS

Equipment, Materials, and Reagent

Basins (salting media), scales, trays, stoves, boilers, emery paper, beaker glass, Erlenmeyer, a set of Soxhlet extraction tools, Whatman no. 41 filter paper, fat-free thread, electric scale, desiccator, funnel, cotton swab, water hose, oven, and water bath were the equipment used in this research. The materials and reagents used were duck eggs, salting media (sand, red brick, and sawdust), green tea, clean water, distilled water, salt, HCl, litmus paper, $AgNO_3$, and ether.

Procedure for Making Salted Eggs

Salted eggs were produced with the following steps: Four (4) pieces of containers for salting eggs were prepared. Duck eggs that had been cleaned were then put into containers, each of which contained five (5) eggs. Egg salting media with various compositions were mixed and then coded A and B. Media A: 500 g of sand, 500 g of red brick powder, and 200 g of ground salt were mixed until homogeneous, and then divided into two parts (one part was added with water and homogenized to form a paste, while the other part was used to make media 1). Media B: 400 g of

sand, 400 g of red brick powder, 200 g of sawdust, were added with 200 g of ground salt, mixed until homogeneous, and then divided into two parts (one part was added with water and homogenized to form a paste, while the other part was to create media 2).

Green tea media were made by brewing 15 g of green tea, added with 1 liter of hot water at 95°C for 15 minutes (Fajar et all., 2016), filtered, and allowed to cool. Green tea media used for producing salted eggs were: Media 1: Media A were combined with 500 ml of green tea and mixed until homogeneous to form a paste. Media 2: Media B were combined with 500 ml of green tea and mixed until homogeneous to form a paste. Duck eggs in procedure 2 were wrapped with a variety of salting media that had been prepared, including media A, B, 1, and 2. Eggs that had been wrapped with various salting media were then ripened for 12 days at room temperature. Eggs were disassembled, washed until clean from the salting media, and then steamed for 2 hours. The salted eggs were then organoleptically tested for texture, color, taste, and aroma, and determined by Soxhlet fat content.

Procedure for Determining Fat Levels

The salted egg yolk was weighed as much as 1-5 g, put into a glass beaker containing 30 ml of HCl 1:1, and then heated until the fat separated (floating on the surface of the solution). The separated fat was filtered with Whatman No. 41 filter paper. The filtrate obtained was checked for acid-free (Cl-) using litmus paper and chloride-free using $AgNO_3$ solution. The filter paper containing fat residue was dried in the oven for 5-10 minutes, folded and tied with fat-free thread, and then extracted on a series of Soxhlet extraction apparatus consisting of a round bottom flask, extractor tube, and condenser, using ether solvent. Extraction was done for 7 cycles until the fat was completely extracted. The fat residue in the round bottom flask was dried in an oven at 60°C for 1-2 hours and then cooled in a desiccator for 30 minutes. The flask containing fat residue was estimated until a constant weight was obtained (Ketaren S., 2012)

Data Analysis

Analysis of the research data was carried out with the One-Way Anova Test because the fat content of salted egg yolks was influenced by the salting media comprising five variations (without the addition of media; sand and red brick; sand, red brick, and sawdust; sand, red brick, and green tea; and sand, red brick, sawdust, and gree tea).

Estimation

Fat weight = last fat weight (constant) – the weight of empty round bottom flask

$$\text{Fat level} = \frac{\text{Fat weight}}{\text{Material weight}} \times 100\%$$

RESULTS AND DISCUSSION

The results of the study on the effect of variations in salted egg media on salted egg fat content are presented in tables including, the characteristic test data and fat content of processed salted egg yolks with media variations, and polygon graphs of changes in fat content results in processed salted eggs. The characteristics of the processed salted egg yolk organoleptic test are detailed in Table 1. Table 1 presents the results of the characteristic test of salted eggs using a variety of salting media. Interpretation on media 1 shows that giving green tea produces white egg white, dark brown egg yolks, and salty taste. Meanwhile, interpretation on media 2 demonstrates that the media produce white egg white, brown egg yolks, and salty taste. Salting medium A, which contains sand and red bricks, without the addition of sawdust, can produce a golden yellow color. Green tea leaves contain catechins (Wulandari and Rahmanisa, 2016) and tannins. The higher the concentration of tea leaf extract in the process of making boiled salted eggs, the higher the tannin content, which functions as an egg-tanner, causing the yolk color to turn brown, as indicated by the use of media B.

Catechins have the greatest ability to inhibit the growth of gram-positive bacteria. (Silondae and Ulpah, 2015). The fat content of duck eggs before treatment (without the addition of media) and salted eggs processed with various salting media are as follows: media A (sand and red bricks), media B (sand, red bricks, and sawdust), media 1 (media A plus green tea), and media 2 (media B plus green tea) are presented in Table 2 and Figure 1. Figure 1 is a polygon graph of the results of fat content determination in salted eggs processed with various salting media.

Table 2 and Figure 1 present the fat content in the salted eggs processed with various salting media: media A (35.22%), media B (33.85%), media 1 (32.86%), and media 2 (30.49%). Eggs without treatment were found to have the highest level of fat content (36.28%). The fat level decreased in eggs processed with green tea, as found in media A and B. The addition of sawdust to the brewed green tea also contributed to the reduction of fat content in salted egg yolk because teak wood powder contains cellulose (40-50%), hemicellulose (20-30%), lignin (20-30%), and a small portion of inorganic materials (Kusumaningrum and Yudanto, 2015). Tannins are polyphenolic compounds derived from plants. Polyphenol compounds play a role in reducing fat levels (Anantaboga, 2012).

Salted eggs processed using green tea media had lower fat content and this was attributed to the antioxidants contained in the green tea leaves. Green tea was brewed for 15 minutes with hot water under the temperature of 95°C. The brewing process affects the release of active substances, including polyphenols, in the tea leaves. The brewing duration of 15 minutes will produce high flavonoids to produce high antioxidants (Balci and Ozdemir, 2016; Fajar, 2016; Fajar et al, 2016). Green tea leaves also contain catechins, which consist of epigallocatechin gallate (EGCG), epigallocatechin (EGC), epicatechin gallate (ECG), epicatechin (EC), and gallocatechin (GC) compounds. Catechine compounds can help reduce fat (Wulandari and Rahmanisa, 2016).

Table 1. The Results of Salted Egg Characteristic Test

No.	Characteristic	Salting Media			
		A	B	1	2
1.	Egg white color	White	White	White	White
2.	Egg yolk color	Golden yellow	Brownish-yellow	Dark brown	Brownish-yellow
3.	Taste	Salty	Salty	Salty	Salty
4.	Smell	Normal	Normal	Normal	Normal

Table 2. Fat Levels of Salted Egg Yolks without Treatment and with Treatment with Media Variations

No	Media	Replication	Fat Level (%)	Average Fat Level (%)
1	Without the addition of media	I	36.32	
		II	36.22	36.28
		III	36.30	
2	A	I	35.18	
		II	35.22	35.22
		III	35.26	
3	B	I	33.86	
		II	33.84	33.85
		III	33.85	
4	1	I	32.84	
		II	32.88	32.86
		III	32.86	
5	2	I	30.52	
		II	30.47	30.49
		III	30.48	

The results of this study are in line with, the treatment of water washing and soaking guava leaf extract (Psidium guajava) which contains tannins and stored at room temperature for 28 days can reduce egg fat content (Dayurani *et. al.,* 2019). This study is also in line with research Kurniati *et. al* (2020) which shows that soaking in green tea gives the best results because it can reduce water content, fat content, and affect the texture of boiled duck eggs.

The research data were analyzed with the One-Way ANOVA Test because the fat content of salted egg yolk was influenced by salting media, consisting of five variations (without the addition of media; sand and red bricks; sand, red bricks, and sawdust; sand, red bricks, and green tea; and sand, red bricks, sawdust, and green tea). If the significance value (sig.) is less than 0.05, it can be concluded that there is a significant difference in the fat content of salted egg yolks. The results of the data analysis are presented in Table 3.

The fat content of salted egg yolk shows the significance value of 0.000 (not zero, but very small). This value was smaller than 0.05, signifying the differences in the fat content of salted egg yolks among the variations of the salting media studied. Furthermore, a Post-Hoc test (advanced test) was carried out with the Tukey test on the variation factors of salting media to specifically determine the differences in fat content of salted egg yolks processed with various salting media. The Post-Hoc test showed that there was a significant difference in the fat content of salted egg yolks among the various salting media. The results of the Post-Hoc test are displayed in Table 4.

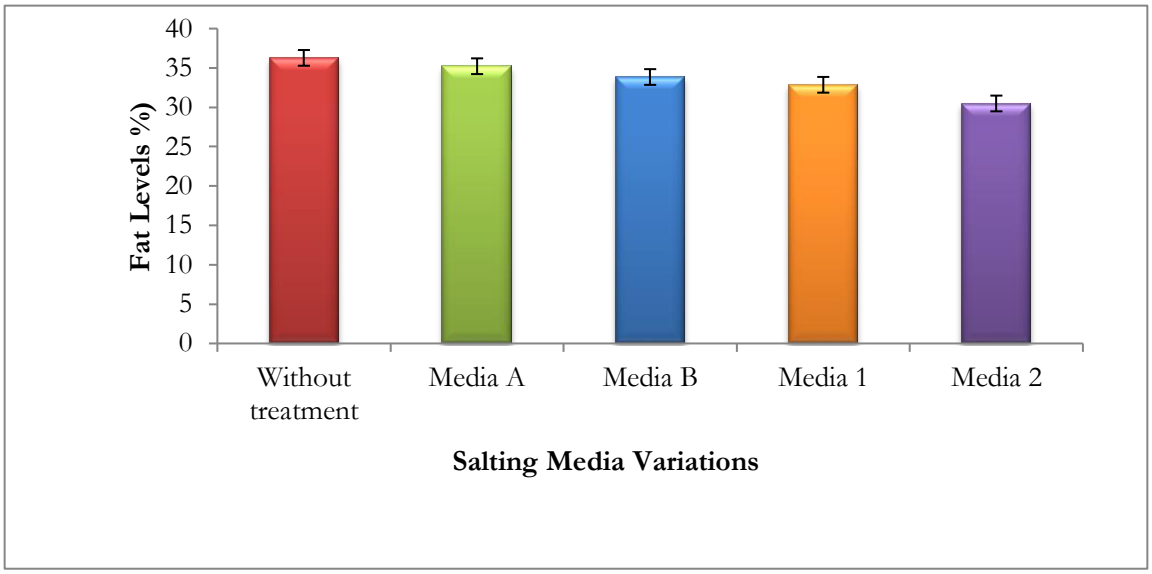

Figure 1. Salted Egg Yolk Fat Content with Various Media. Without Treatment: Eggs without treatment; Media A: Sand and red bricks; Media B: Sand, red bricks, and sawdust; Media 1: Sand, red bricks, and green tea; Media 2: Sand, red bricks, sawdust, and green tea.

Table 3. The Results of ANOVA Test

Fat Levels					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Among Groups	59.973	4	14.993	13386.830	.000
Within Groups	.011	10	.001		
Total	59.984	14			

Table 4. The Results of Post-Hoc Test: Multiple Comparisons
Dependent Variable: Fat Levels
Tukey HSD

(I) Media Variation	(J) Media Variation	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Without Addition	Sand and red bricks	1.06000*	.02733	.000	.9701	1.1499
	Sand, red bricks, and sawdust	2.43000*	.02733	.000	2.3401	2.5199
	San, red bricks, green tea	3.42000*	.02733	.000	3.3301	3.5099
	Sand, red bricks, sawdust, and green tea	5.79000*	.02733	.000	5.7001	5.8799
Sand and red bricks	Without addition	-1.06000*	.02733	.000	-1.1499	-.9701
	Sand, red bricks, and sawdust	1.37000*	.02733	.000	1.2801	1.4599
	Sand, red bricks, and green tea	2.36000*	.02733	.000	2.2701	2.4499
	Sand, red bricks, sawdust, and green tea	4.73000*	.02733	.000	4.6401	4.8199
Sand, red bricks, and sawdust	Without addition	-2.43000*	.02733	.000	-2.5199	-2.3401
	Sand, red bricks, and sawdust	-1.37000*	.02733	.000	-1.4599	-1.2801
	Sand, red bricks, and green tea	.99000*	.02733	.000	.9001	1.0799
	Sand, red bricks, sawdust, and green tea	3.36000*	.02733	.000	3.2701	3.4499
Sand, red bricks, and green tea	Without addition	-3.42000*	.02733	.000	-3.5099	-3.3301
	Sand, red bricks, and sawdust	-2.36000*	.02733	.000	-2.4499	-2.2701
	Sand, red bricks, and green tea	-.99000*	.02733	.000	-1.0799	-.9001
	Sand, red bricks, sawdust, and green tea	2.37000*	.02733	.000	2.2801	2.4599
Sand, red bricks, sawdust, and green tea	Without addition	-5.79000*	.02733	.000	-5.8799	-5.7001
	Sand, red bricks, and sawdust	-4.73000*	.02733	.000	-4.8199	-4.6401
	Sand, red bricks, and green tea	-3.36000*	.02733	.000	-3.4499	-3.2701
	Sand, red bricks, sawdust, and green tea	-2.37000*	.02733	.000	-2.4599	-2.2801

*. The mean difference is significant at the 0.05 level.

CONCLUSION

This study concludes the fat content of salted egg yolk in media 1, which consists of medium A (sand and red brick) and brewed green tea, reaches 32.86%, and in medium 2, which consists of medium B (sand, red brick, and sawdust) and brewed green tea reaches 30.49%. The results of the ANOVA test signify the effect of the addition of green tea to the salting media on the fat content of salted eggs.Further research is required on the examination of fat content in salting media after being used for salting eggs.

REFERENCES

Anantaboga, J. (2012). *Tangkal Seabrek Penyakit Dengan Teh Hijau.* Yogyakarta: Diva Press.

Balci, F. & Ozdemir, F. (2016). Influence of shooting period and extraction conditions on bioactive compounds in Turkish green tea. *Journal Food Science and Technology*. 36(4):737-743. https://doi.org/10.1590/1678-457X.17016

Dayurani, R., Mardiati, S. M., & Djaelani, M. A. (2019). Kadar Lemak, Indeks Kuning Telur, dan Susut Bobot Telur Itik setelah Pencucian Air dan Perendaman Ekstrak Daun Jambu Biji (Psidium guajava). Buletin Anatomi dan Fisiologi, 4(1), 35-44. https://doi.org/10.14710/baf.4.1.2019.35-44

Fajar, R., Wrasiati, L., & Suhendra, L. (2018). Kandungan Senyawa Flavonoid Dan Aktivitas Antioksidan Ekstrak Teh Hijau Pada Perlakuan Suhu Awal Dan Lama Penyeduhan. *Jurnal Rekayasa Dan Manajemen Agroindustri, 6*(3), 196-202. https://doi.org/10.24843/JRMA.2018.v06.i03.p02

Hakim, L., Valentinus, P.B., Bambang, D. (2017). Kandungan Lemak, Tekstur Kemasiran dan Kesukaan Telur Asin dengan Penambahan Jahe sebagai Penyedap. *Jurnal Aplikasi Teknologi Pangan* 6 (3), 124-128 http://dx.doi.org/10.17728/jatp.199

Ketaren, S. (2012). Pengantar Teknologi Minyak dan Lemak Pangan. Jakarta: UI Press.

Kurniati, D., Bintoro, V. P., & Dwiloka, B. (2020). Pengaruh Perendaman dalam Teh Hijau Dan Teh Hitam Terhadap Kadar Air, Kadar Lemak,

Kadar Protein, dan Mutu Hedonik Telur Itik Rebus. *Journal of Nutrition College, 9*(3), 197-201. https://doi.org/10.14710/jnc.v9i3.26947

Kusumaningrum and Yudanto. (2009). *Pembuatan Briket Bioarang Dari Arang Serbuk Gergaji Kayu Jati*. Jurusan Teknik Kimia, Fakultas Teknik, Universitas Diponegoro. http://eprints.undip.ac.id/3682/

Muharlien. (2010). Meningkatkan Kualitas Telur Melalui Penambahan Teh Hijau Dalam Pakan Ayam Petelur. *Jurnal Ilmu dan Teknologi Hasil Ternak*, 5(1): 32-37.

Silondae, H. and Ulpah, A. (2015). Peningkatan Telur Ayam Ras dengan Perendaman dalam Larutan Teh. *Jurnal Penelitian Pascapanen Pertanian* | Volume 12 No.3 Desember 2015 : 124 - 128

Yuniati, H., Almasyhuri. (2012). Pengaruh perbedaan media dan waktu pengasinan pada pembuatan telur asin terhadap kandungan iodium telur. *Media Litbang Kesehatan*, 22(3), 138-143.

Zulaekah, S dan E. N. Widiyaningsih. (2005). Pengaruh Konsentrasi Ekstrak Daun Teh pada Pembuatan Telur Asin Rebus Terhadap Jumlah Bakteri dan Daya Terimanya. *Jurnal Penelitian Sains dan Teknologi*, 6(1): 1-13.

Wulandari, R. and Rahmanisa, S. (2016). Pengaruh Ekstrak Teh Hijau Terhadap Penurunan Berat Badan pada Remaja. *Jurnal Majority,* 5 (2)*:106 – 111.*

11% Overall Similarity

Top sources found in the following databases:

- 9% Internet database
- Crossref database
- 4% Submitted Works database
- 8% Publications database
- Crossref Posted Content database

TOP SOURCES

The sources with the highest number of matches within the submission. Overlapping sources will not be displayed.

1	**ejurnal.setiabudi.ac.id** Internet	2%
2	**Alex Jekson Tukira, Lucia Sincu Gunawan, Edy Prasetya. "Erythrocyte ...** Crossref	<1%
3	**Lilan Xu, Yan Zhao, Mingsheng Xu, Yao Yao, Xuliang Nie, Huaying Du, Y...** Crossref	<1%
4	**core.ac.uk** Internet	<1%
5	**ejournal2.undip.ac.id** Internet	<1%
6	**Fitri Kurniasari, Jena Hayu Widyasti. "Uji Iritasi dan Uji Sifat Fisik Sedia...** Crossref	<1%
7	**The Robert Gordon University on 2011-10-03** Submitted works	<1%
8	**res.mdpi.com** Internet	<1%

9	Jin Ze Xu, Lai Kwok Leung, Yu Huang, Zhen-Yu Chen. "Epimerisation of... Crossref	<1%
10	1sthappyfamily.com Internet	<1%
11	adoc.pub Internet	<1%
12	Morgan State University on 2021-11-18 Submitted works	<1%
13	Sekolah Ciiputra High School on 2011-08-26 Submitted works	<1%
14	Udayana University on 2022-05-06 Submitted works	<1%
15	ejournal.unwmataram.ac.id Internet	<1%
16	media.neliti.com Internet	<1%
17	Hirao, K.. "Tea catechins reduce inflammatory reactions via mitogen-a... Crossref	<1%
18	Udayana University on 2019-01-07 Submitted works	<1%
19	docobook.com Internet	<1%
20	eprints.ukmc.ac.id Internet	<1%

21	repository.ub.ac.id Internet	<1%
22	Ajeng Ayu Pebriani, Maya Uzia Beandrade. "FORMULATION AND EVAL... Crossref	<1%
23	Hanna Rizqi Nurbaety, Nurwati Nurwati. "Process Of Egg Salt Smoke In... Crossref	<1%
24	eprints.umm.ac.id Internet	<1%